
AMETHYST LANE – ENERGY STATEMENT ADDENDUM
APPLICATION 230613 – CONDITION 28

Demolition and redevelopment of the Amethyst Lane to deliver a new respite care facility alongside 17 new homes, landscaping and ancillary works approved 15 March 2024

EngDesign Ltd
106 – 108 Bermondsey
Street
London
SE1 3TX

3365-ME-XX-SP-ME-9001
October 2024
IMS/IH/MES

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Revision	Date	Comments	Author
-	October 2024	1 st Issue	IMS/IH

INTRODUCTION

This report forms an addendum to the previously issued HTA Design Energy Strategy And Overheating Assessment of July 2023, and supersedes the Technical Note (HTA Design RBC-ALR Energy Addendum) of November 2023. It specifically relates to Condition 28 of the planning consent for the Amethyst Lane Scheme (application number 230613):

“No development shall commence on site except demolition works and ground works until written verification has been submitted to and approved in writing by the Local Planning Authority demonstrating that all of the dwellings hereby permitted will achieve a minimum of a 35% improvement in the dwelling emission rate over the target emission rate, as defined in The Building Regulations for England Approved Document L1A: Conservation of Fuel and Power in New Dwellings (2013 edition), a commitment in writing that a S106 contribution will be made to the Local Authority to account for any remaining emissions, and will be built to the higher water efficiency standard under Regulation 36(3). Such evidence shall be in the form of a ‘Design Stage’ Standard Assessment Procedure (SAP) Assessment, produced by an accredited energy assessor”

Design stage SAP calculations have been produced, based on the latest design parameters (as outlined in Table 1 below). The compliance reports from these calculations, which detail both the Target Emission Rate (TER) and Design Emission Rate (DER), may be found in Appendix A.

The non domestic section of the scheme, namely the Respite Centre, has been modelled using SBEM calculations. The design stage assessment may be found in Appendix B. This details the Target Emission Rate (TER) and Building Emission Rate (BER).

Parameter	Value
Roof U-Value (W/m ² K)	0.08/0.10
Walls U-Value (W/m ² K)	0.13
Floors U-Value (W/m ² K)	0.13
Windows U-Value (W/m ² K)	0.88
Windows g-value	0.63
Doors U-Value (W/m ² K)	0.88
Air permeability (m ³ /h m ² @ 50 Pa)	0.6
Ventilation	MVHR – Zehnder ComfoAir Q350 GB ST 
Heating System/Hot Water	ASHP – Mitsubishi Ecodan 6.0 kW PUZ-WM60VAA with 210 l cylinder 
Low Energy Lighting	80.5 lm/W

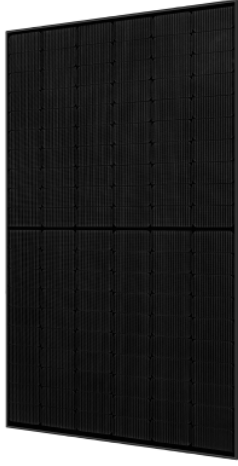
Parameter	Value
Photovoltaics	355 kW _p total 

Table 1: Summary of design energy efficiency measures

RESULTS SUMMARY & CONCLUSION

Houses

The TER and DER are summarised in Table 2, which also details the percentage improvement for each dwelling. Further, Table 2 details the total target and design CO₂ emissions (obtained by multiplying the TER/DER by the dwelling total floor area).

Plot	TER (kg CO ₂ /m ² /yr)	DER (kg CO ₂ /m ² /yr)	% Improvement	Target Emissions (tonne CO ₂ /yr)	Design Emissions (tonne CO ₂ /yr)
A01	9.12	-2.13	123.4	1.3	-0.3
A02	8.49	-2.28	126.9	1.2	-0.3
A03	9.79	-1.62	116.5	0.9	-0.2
A04	9.79	-1.62	116.5	0.9	-0.2
A05	9.79	-1.62	116.5	0.9	-0.2
A06	9.79	-1.62	116.5	0.9	-0.2
A07	8.49	-2.28	126.9	1.2	-0.3
A08	9.12	-2.13	123.4	1.3	-0.3
B01	10.89	-4.29	139.4	1.1	-0.4
B02	9.80	-4.20	142.9	1.0	-0.4
B03	9.80	-4.20	142.9	1.0	-0.4
B04	9.92	-4.37	144.1	1.0	-0.4
B05	13.28	0.27	98.0	1.9	0.0
C01	11.78	0.06	99.5	1.7	0.0
C02	9.93	-3.99	140.2	1.0	-0.4
C03	9.93	-3.99	140.2	1.0	-0.4
C04	13.29	0.27	98.0	1.9	0.0
Total (tonne CO₂/yr)				20.1	-4.3

Table 2: Summary of design stage SAP results

These show that the target emissions total 20.1 tonne CO₂/annum, with design emissions of 4.3 tonne CO₂/annum, **a 121.2% improvement over the target** (an improvement over the 119% previously reported), and so there is no S106 contribution required.

Respite Centre

The design stage SBEM results are summarised in Table 3 below. This indicates a reduction in emissions of **191.1% over the target**.

TER (kg CO ₂ /m ² /yr)	TER (kg CO ₂ /m ² /yr)	% Improvement
6.17	-5.62	191.1

Table 3: Design stage SBEM results

APPENDIX A: DESIGN STAGE SAP CALCULATIONS COMPLIANCE REPORTS

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:19

Project Information			
Assessed By	Liam Mason	Building Type	House, End-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	141 m ²
Site Reference	A_01	Plot Reference	A 01 4B8P
Address	A_01, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	9.12 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	-2.13 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	47.66 kWh _{PE} /m ²		
Dwelling primary energy	-1.14 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	37.8 kWh/m ²		
Dwelling fabric energy efficiency	31.2 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.08	Roof (1) (0.08)	OK
Windows, doors, and roof windows	1.6	0.89	D_1 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))			
Name	Net area [m ²]	U-Value [W/m ² K]	
Exposed wall: Walls (1)	111.43	0.13	(!)
Party wall: Party Wall (1)	51.93	0	(!)
Ground floor: Floor 1, Floor 1	70.8	0.13	
Exposed roof: Roof (1)	70.8	0.08	(!)

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_1, W_1	1.74	North	0.7	0.88 (!)
W_2, W_2	2.21	South	0.7	0.88 (!)
W_3, W_3	1.94	South	0.7	0.88 (!)
W_4, W_4	0.79	South	0.7	0.88 (!)
W_5, W_5	2.22	North	0.7	0.88 (!)
W_6, W_6	1.74	North	0.7	0.88 (!)
W_7, W_7	2.06	North	0.7	0.88 (!)
W_8, W_8	0.79	West	0.7	0.88 (!)
W_9, W_9	1.94	North	0.7	0.88 (!)
W_10, W_10	1.94	South	0.7	0.88 (!)
W_11, W_11	0.41	South	0.7	0.88 (!)
W_12, W_12	0.74	South	0.7	0.88 (!)
W_13, W_13	1.94	North	0.7	0.88 (!)

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_14, W_14	2.21	South	0.7	0.88 (!)
D_1, D_1	2.12	South	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))

Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.043	
External wall	E12: Gable (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.09	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	

3 Air permeability (better than typically expected values are flagged with a subsequent (!))

Maximum permitted air permeability at 50Pa	8 m ³ /hm ²	
Dwelling air permeability at 50Pa	0.6 m ³ /hm ² , Design value (!)	OK
Air permeability test certificate reference		

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity

Efficiency	354.1%
Emitter type	Both radiators and underfloor
Flow temperature	35°C
System type	Heat Pump
Manufacturer	Mitsubishi Electric Europe B.V.
Model	Ecodan 6.0 kW
Commissioning	

Secondary heating system: N/A

Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	210 litres
Declared heat loss	2.06 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	

Waste water heat recovery system 1 - type: N/A

Efficiency	
Manufacturer	
Model	

6 Controls		
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services		
Function		
Ecodesign class		
Manufacturer		
Model		
Water heating - type: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		
7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.53 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	95%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	6.39 kWp	
Orientation	South	
Pitch	30°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:20

Project Information			
Assessed By	Liam Mason	Building Type	House, Mid-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	142 m ²
Site Reference	A_02	Plot Reference	A 02 4B8P
Address	A_02, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	8.49 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	-2.28 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	44.28 kWh _{PE} /m ²		
Dwelling primary energy	-2.71 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	34.5 kWh/m ²		
Dwelling fabric energy efficiency	28.3 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.08	Roof (1) (0.08)	OK
Windows, doors, and roof windows	1.6	0.89	D_2 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))			
Name	Net area [m ²]	U-Value [W/m ² K]	
Exposed wall: Walls (1)	60.29	0.13	(!)
Party wall: Party Wall (1)	103.86	0	(!)
Ground floor: Floor 1, Floor 1	70.8	0.13	
Exposed roof: Roof (1)	70.8	0.08	(!)

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_15, W_15	2.21	South	0.7	0.88 (!)
W_16, W_16	1.74	North	0.7	0.88 (!)
W_17, W_17	2.22	North	0.7	0.88 (!)
W_18, W_18	0.79	South	0.7	0.88 (!)
W_19, W_19	2.21	South	0.7	0.88 (!)
W_20, W_20	1.74	North	0.7	0.88 (!)
W_21, W_21	1.94	South	0.7	0.88 (!)
W_22, W_22	0.41	South	0.7	0.88 (!)
W_23, W_23	0.74	South	0.7	0.88 (!)
W_24, W_24	1.94	North	0.7	0.88 (!)
W_25, W_25	1.94	North	0.7	0.88 (!)
W_26, W_26	1.94	South	0.7	0.88 (!)
W_27, W_27	2.06	North	0.7	0.88 (!)

Name	Area [m²]	Orientation	Frame factor	U-Value [W/m²K]
D_2, D_2	2.12	South	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling : Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.043	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	

3 Air permeability (better than typically expected values are flagged with a subsequent (!))		
Maximum permitted air permeability at 50Pa		8 m ³ /hm ²
Dwelling air permeability at 50Pa		0.6 m ³ /hm ² , Design value (!)
Air permeability test certificate reference		OK

4 Space heating	
Main heating system 1 : Heat pump with radiators or underfloor heating - Electricity	
Efficiency	352.0%
Emitter type	Both radiator and underfloor
Flow temperature	35°C
System type	Heat Pump
Manufacturer	Mitsubishi Electric Europe B.V.
Model	Ecodan 6.0 kW
Commissioning	
Secondary heating system : N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water	
Cylinder/store - type: Cylinder	
Capacity	210 litres
Declared heat loss	2.06 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	
Waste water heat recovery system 1 - type: N/A	
Efficiency	
Manufacturer	
Model	

6 Controls	
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services	
Function	
Ecodesign class	
Manufacturer	
Model	

Water heating - type: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		
7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.53 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	95%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	6.39 kWp	
Orientation	South	
Pitch	30°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:23

Project Information			
Assessed By	Liam Mason	Building Type	House, Mid-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	93 m ²
Site Reference	A_03	Plot Reference	A 03 3B5P
Address	A_03, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	9.79 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	-1.62 kgCO ₂ /m ²		OK

1b Target primary energy rate and dwelling primary energy			
Target primary energy	50.9 kWh _{PE} /m ²		
Dwelling primary energy	3.28 kWh _{PE} /m ²		OK

1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	32.1 kWh/m ²		
Dwelling fabric energy efficiency	26.3 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.08	Roof (1) (0.08)	OK
Windows, doors, and roof windows	1.6	0.89	D_3 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))			
Name	Net area [m ²]	U-Value [W/m ² K]	
Exposed wall: Walls (1)	37.59	0.13	(!)
Party wall: Party Wall (1)	103.86	0	(!)
Ground floor: Floor 1, Floor 1	46.51	0.13	
Exposed roof: Roof (1)	46.51	0.08	(!)

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_28, W_28	1.74	North	0.7	0.88 (!)
W_29, W_29	2.22	North	0.7	0.88 (!)
W_30, W_30	1.94	South	0.7	0.88 (!)
W_31, W_31	0.41	South	0.7	0.88 (!)
W_32, W_32	1.94	South	0.7	0.88 (!)
W_33, W_33	1.94	North	0.7	0.88 (!)
W_34, W_34	2.21	South	0.7	0.88 (!)
W_35, W_35	0.74	South	0.7	0.88 (!)
W_36, W_36	0.79	South	0.7	0.88 (!)
W_37, W_37	1.74	North	0.7	0.88 (!)
D_3, D_3	2.12	South	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.043	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	
3 Air permeability (better than typically expected values are flagged with a subsequent (!))				
Maximum permitted air permeability at 50Pa		8 m³/hm²		
Dwelling air permeability at 50Pa		0.6 m³/hm², Design value (!)		OK
Air permeability test certificate reference				
4 Space heating				
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity				
Efficiency	332.7%			
Emitter type	Both radiators and underfloor			
Flow temperature	35°C			
System type	Heat Pump			
Manufacturer	Mitsubishi Electric Europe B.V.			
Model	Ecodan 6.0 kW			
Commissioning				
Secondary heating system: N/A				
Fuel	N/A			
Efficiency	N/A			
Commissioning				
5 Hot water				
Cylinder/store - type: Cylinder				
Capacity	210 litres			
Declared heat loss	2.06 kWh/day			
Primary pipework insulated	Yes			
Manufacturer				
Model				
Commissioning				
Waste water heat recovery system 1 - type: N/A				
Efficiency				
Manufacturer				
Model				
6 Controls				
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services				
Function				
Ecodesign class				
Manufacturer				
Model				
Water heating - type: Cylinder thermostat and HW separately timed				
Manufacturer				
Model				

7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.53 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	95%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	4.26 kWp	
Orientation	South	
Pitch	30°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:26

Project Information			
Assessed By	Liam Mason	Building Type	House, Mid-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	93 m ²
Site Reference	A_04	Plot Reference	A 04 3B5P
Address	A_04, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	9.79 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	-1.62 kgCO ₂ /m ²		OK

1b Target primary energy rate and dwelling primary energy			
Target primary energy	50.9 kWh _{PE} /m ²		
Dwelling primary energy	3.28 kWh _{PE} /m ²		OK

1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	32.1 kWh/m ²		
Dwelling fabric energy efficiency	26.3 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.08	Roof (1) (0.08)	OK
Windows, doors, and roof windows	1.6	0.89	D_3 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))			
Name	Net area [m ²]	U-Value [W/m ² K]	
Exposed wall: Walls (1)	37.59	0.13	(!)
Party wall: Party Wall (1)	103.86	0	(!)
Ground floor: Floor 1, Floor 1	46.51	0.13	
Exposed roof: Roof (1)	46.51	0.08	(!)

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_28, W_28	1.74	North	0.7	0.88 (!)
W_29, W_29	2.22	North	0.7	0.88 (!)
W_30, W_30	1.94	South	0.7	0.88 (!)
W_31, W_31	0.41	South	0.7	0.88 (!)
W_32, W_32	1.94	South	0.7	0.88 (!)
W_33, W_33	1.94	North	0.7	0.88 (!)
W_34, W_34	2.21	South	0.7	0.88 (!)
W_35, W_35	0.74	South	0.7	0.88 (!)
W_36, W_36	0.79	South	0.7	0.88 (!)
W_37, W_37	1.74	North	0.7	0.88 (!)
D_3, D_3	2.12	South	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.043	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	
3 Air permeability (better than typically expected values are flagged with a subsequent (!))				
Maximum permitted air permeability at 50Pa		8 m³/hm²		
Dwelling air permeability at 50Pa		0.6 m³/hm², Design value (!)		OK
Air permeability test certificate reference				
4 Space heating				
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity				
Efficiency	332.7%			
Emitter type	Both radiators and underfloor			
Flow temperature	35°C			
System type	Heat Pump			
Manufacturer	Mitsubishi Electric Europe B.V.			
Model	Ecodan 6.0 kW			
Commissioning				
Secondary heating system: N/A				
Fuel	N/A			
Efficiency	N/A			
Commissioning				
5 Hot water				
Cylinder/store - type: Cylinder				
Capacity	210 litres			
Declared heat loss	2.06 kWh/day			
Primary pipework insulated	Yes			
Manufacturer				
Model				
Commissioning				
Waste water heat recovery system 1 - type: N/A				
Efficiency				
Manufacturer				
Model				
6 Controls				
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services				
Function				
Ecodesign class				
Manufacturer				
Model				
Water heating - type: Cylinder thermostat and HW separately timed				
Manufacturer				
Model				

7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.53 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	95%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	4.26 kWp	
Orientation	South	
Pitch	30°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:29

Project Information			
Assessed By	Liam Mason	Building Type	House, Mid-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	93 m ²
Site Reference	A_05	Plot Reference	A 05 3B5P
Address	A_05, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	9.79 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	-1.62 kgCO ₂ /m ²		OK

1b Target primary energy rate and dwelling primary energy			
Target primary energy	50.9 kWh _{PE} /m ²		
Dwelling primary energy	3.28 kWh _{PE} /m ²		OK

1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	32.1 kWh/m ²		
Dwelling fabric energy efficiency	26.3 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.08	Roof (1) (0.08)	OK
Windows, doors, and roof windows	1.6	0.89	D_3 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))			
Name	Net area [m ²]	U-Value [W/m ² K]	
Exposed wall: Walls (1)	37.59	0.13	(!)
Party wall: Party Wall (1)	103.86	0	(!)
Ground floor: Floor 1, Floor 1	46.51	0.13	
Exposed roof: Roof (1)	46.51	0.08	(!)

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_28, W_28	1.74	North	0.7	0.88 (!)
W_29, W_29	2.22	North	0.7	0.88 (!)
W_30, W_30	1.94	South	0.7	0.88 (!)
W_31, W_31	0.41	South	0.7	0.88 (!)
W_32, W_32	1.94	South	0.7	0.88 (!)
W_33, W_33	1.94	North	0.7	0.88 (!)
W_34, W_34	2.21	South	0.7	0.88 (!)
W_35, W_35	0.74	South	0.7	0.88 (!)
W_36, W_36	0.79	South	0.7	0.88 (!)
W_37, W_37	1.74	North	0.7	0.88 (!)
D_3, D_3	2.12	South	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.043	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	
3 Air permeability (better than typically expected values are flagged with a subsequent (!))				
Maximum permitted air permeability at 50Pa		8 m³/hm²		
Dwelling air permeability at 50Pa		0.6 m³/hm², Design value (!)		OK
Air permeability test certificate reference				
4 Space heating				
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity				
Efficiency	332.7%			
Emitter type	Both radiators and underfloor			
Flow temperature	35°C			
System type	Heat Pump			
Manufacturer	Mitsubishi Electric Europe B.V.			
Model	Ecodan 6.0 kW			
Commissioning				
Secondary heating system: N/A				
Fuel	N/A			
Efficiency	N/A			
Commissioning				
5 Hot water				
Cylinder/store - type: Cylinder				
Capacity	210 litres			
Declared heat loss	2.06 kWh/day			
Primary pipework insulated	Yes			
Manufacturer				
Model				
Commissioning				
Waste water heat recovery system 1 - type: N/A				
Efficiency				
Manufacturer				
Model				
6 Controls				
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services				
Function				
Ecodesign class				
Manufacturer				
Model				
Water heating - type: Cylinder thermostat and HW separately timed				
Manufacturer				
Model				

7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.53 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	95%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	4.26 kWp	
Orientation	South	
Pitch	30°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:32

Project Information			
Assessed By	Liam Mason	Building Type	House, Mid-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	93 m ²
Site Reference	A_06	Plot Reference	A 06 3B5P
Address	A_06, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	9.79 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	-1.62 kgCO ₂ /m ²		OK

1b Target primary energy rate and dwelling primary energy			
Target primary energy	50.9 kWh _{PE} /m ²		
Dwelling primary energy	3.28 kWh _{PE} /m ²		OK

1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	32.1 kWh/m ²		
Dwelling fabric energy efficiency	26.3 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.08	Roof (1) (0.08)	OK
Windows, doors, and roof windows	1.6	0.89	D_3 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))			
Name	Net area [m ²]	U-Value [W/m ² K]	
Exposed wall: Walls (1)	37.59	0.13	(!)
Party wall: Party Wall (1)	103.86	0	(!)
Ground floor: Floor 1, Floor 1	46.51	0.13	
Exposed roof: Roof (1)	46.51	0.08	(!)

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_28, W_28	1.74	North	0.7	0.88 (!)
W_29, W_29	2.22	North	0.7	0.88 (!)
W_30, W_30	1.94	South	0.7	0.88 (!)
W_31, W_31	0.41	South	0.7	0.88 (!)
W_32, W_32	1.94	South	0.7	0.88 (!)
W_33, W_33	1.94	North	0.7	0.88 (!)
W_34, W_34	2.21	South	0.7	0.88 (!)
W_35, W_35	0.74	South	0.7	0.88 (!)
W_36, W_36	0.79	South	0.7	0.88 (!)
W_37, W_37	1.74	North	0.7	0.88 (!)
D_3, D_3	2.12	South	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.043	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	
3 Air permeability (better than typically expected values are flagged with a subsequent (!))				
Maximum permitted air permeability at 50Pa		8 m³/hm²		
Dwelling air permeability at 50Pa		0.6 m³/hm², Design value (!)		OK
Air permeability test certificate reference				
4 Space heating				
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity				
Efficiency		332.7%		
Emitter type		Both radiators and underfloor		
Flow temperature		35°C		
System type		Heat Pump		
Manufacturer		Mitsubishi Electric Europe B.V.		
Model		Ecodan 6.0 kW		
Commissioning				
Secondary heating system: N/A				
Fuel		N/A		
Efficiency		N/A		
Commissioning				
5 Hot water				
Cylinder/store - type: Cylinder				
Capacity		210 litres		
Declared heat loss		2.06 kWh/day		
Primary pipework insulated		Yes		
Manufacturer				
Model				
Commissioning				
Waste water heat recovery system 1 - type: N/A				
Efficiency				
Manufacturer				
Model				
6 Controls				
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services				
Function				
Ecodesign class				
Manufacturer				
Model				
Water heating - type: Cylinder thermostat and HW separately timed				
Manufacturer				
Model				

7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.53 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	95%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	4.26 kWp	
Orientation	South	
Pitch	30°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:34

Project Information			
Assessed By	Liam Mason	Building Type	House, Mid-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	142 m ²
Site Reference	A_07	Plot Reference	A 07 4B8P
Address	A_07, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	8.49 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	-2.28 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	44.28 kWh _{PE} /m ²		
Dwelling primary energy	-2.71 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	34.5 kWh/m ²		
Dwelling fabric energy efficiency	28.3 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.08	Roof (1) (0.08)	OK
Windows, doors, and roof windows	1.6	0.89	D_2 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))			
Name	Net area [m ²]	U-Value [W/m ² K]	
Exposed wall: Walls (1)	60.29	0.13 (!)	
Party wall: Party Wall (1)	103.86	0 (!)	
Ground floor: Floor 1, Floor 1	70.8	0.13	
Exposed roof: Roof (1)	70.8	0.08 (!)	

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_15, W_15	2.21	South	0.7	0.88 (!)
W_16, W_16	1.74	North	0.7	0.88 (!)
W_17, W_17	2.22	North	0.7	0.88 (!)
W_18, W_18	0.79	South	0.7	0.88 (!)
W_19, W_19	2.21	South	0.7	0.88 (!)
W_20, W_20	1.74	North	0.7	0.88 (!)
W_21, W_21	1.94	South	0.7	0.88 (!)
W_22, W_22	0.41	South	0.7	0.88 (!)
W_23, W_23	0.74	South	0.7	0.88 (!)
W_24, W_24	1.94	North	0.7	0.88 (!)
W_25, W_25	1.94	North	0.7	0.88 (!)
W_26, W_26	1.94	South	0.7	0.88 (!)
W_27, W_27	2.06	North	0.7	0.88 (!)

Name	Area [m²]	Orientation	Frame factor	U-Value [W/m²K]
D_2, D_2	2.12	South	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling : Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.043	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	

3 Air permeability (better than typically expected values are flagged with a subsequent (!))		
Maximum permitted air permeability at 50Pa		8 m ³ /hm ²
Dwelling air permeability at 50Pa		0.6 m ³ /hm ² , Design value (!)
Air permeability test certificate reference		OK

4 Space heating	
Main heating system 1 : Heat pump with radiators or underfloor heating - Electricity	
Efficiency	352.0%
Emitter type	Both radiators and underfloor
Flow temperature	35°C
System type	Heat Pump
Manufacturer	Mitsubishi Electric Europe B.V.
Model	Ecodan 6.0 kW
Commissioning	
Secondary heating system : N/A	
Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water	
Cylinder/store - type: Cylinder	
Capacity	210 litres
Declared heat loss	2.06 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	
Waste water heat recovery system 1 - type: N/A	
Efficiency	
Manufacturer	
Model	

6 Controls	
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services	
Function	
Ecodesign class	
Manufacturer	
Model	

Water heating - type: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		
7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.53 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	95%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	6.39 kWp	
Orientation	South	
Pitch	30°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:36

Project Information			
Assessed By	Liam Mason	Building Type	House, End-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	141 m ²
Site Reference	A_08	Plot Reference	A 08 4B8P
Address	A_08, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	9.12 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	-2.13 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	47.66 kWh _{PE} /m ²		
Dwelling primary energy	-1.14 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	37.8 kWh/m ²		
Dwelling fabric energy efficiency	31.2 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.08	Roof (1) (0.08)	OK
Windows, doors, and roof windows	1.6	0.89	D_1 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))			
Name	Net area [m ²]	U-Value [W/m ² K]	
Exposed wall: Walls (1)	111.43	0.13 (!)	
Party wall: Party Wall (1)	51.93	0 (!)	
Ground floor: Floor 1, Floor 1	70.8	0.13	
Exposed roof: Roof (1)	70.8	0.08 (!)	

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_1, W_1	1.74	North	0.7	0.88 (!)
W_2, W_2	2.21	South	0.7	0.88 (!)
W_3, W_3	1.94	South	0.7	0.88 (!)
W_4, W_4	0.79	South	0.7	0.88 (!)
W_5, W_5	2.22	North	0.7	0.88 (!)
W_6, W_6	1.74	North	0.7	0.88 (!)
W_7, W_7	2.06	North	0.7	0.88 (!)
W_8, W_8	0.79	East	0.7	0.88 (!)
W_9, W_9	1.94	North	0.7	0.88 (!)
W_10, W_10	1.94	South	0.7	0.88 (!)
W_11, W_11	0.41	South	0.7	0.88 (!)
W_12, W_12	0.74	South	0.7	0.88 (!)
W_13, W_13	1.94	North	0.7	0.88 (!)

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_14, W_14	2.21	South	0.7	0.88 (!)
D_1, D_1	2.12	South	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))

Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.043	
External wall	E12: Gable (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.09	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	

3 Air permeability (better than typically expected values are flagged with a subsequent (!))

Maximum permitted air permeability at 50Pa	8 m ³ /hm ²	
Dwelling air permeability at 50Pa	0.6 m ³ /hm ² , Design value (!)	OK
Air permeability test certificate reference		

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity

Efficiency	354.1%
Emitter type	Both radiators and underfloor
Flow temperature	35°C
System type	Heat Pump
Manufacturer	Mitsubishi Electric Europe B.V.
Model	Ecodan 6.0 kW
Commissioning	

Secondary heating system: N/A

Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	210 litres
Declared heat loss	2.06 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	

Waste water heat recovery system 1 - type: N/A

Efficiency	
Manufacturer	
Model	

6 Controls		
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services		
Function		
Ecodesign class		
Manufacturer		
Model		
Water heating - type: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		
7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.53 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	95%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	6.39 kWp	
Orientation	South	
Pitch	30°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:38

Project Information			
Assessed By	Liam Mason	Building Type	House, End-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	100 m ²
Site Reference	B_01	Plot Reference	B 01 3B6P
Address	B_01, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	10.89 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	-4.29 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	56.9 kWh _{PE} /m ²		
Dwelling primary energy	-8.95 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	38.8 kWh/m ²		
Dwelling fabric energy efficiency	31.8 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.08	Roof (1) (0.08)	OK
Windows, doors, and roof windows	1.6	0.9	D_4 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))		
Name	Net area [m ²]	U-Value [W/m ² K]
Exposed wall: Walls (1)	95.77	0.13 (!)
Party wall: Party Wall (1)	47.54	0 (!)
Ground floor: Floor 1, Floor 1	50.02	0.13
Exposed roof: Roof (1)	50.02	0.08 (!)

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_38, W_38	0.41	East	0.7	0.88 (!)
W_39, W_39	0.74	East	0.7	0.88 (!)
W_40, W_40	1.94	West	0.7	0.88 (!)
W_41, W_41	1.74	West	0.7	0.88 (!)
W_42, W_42	0.79	West	0.7	0.88 (!)
W_43, W_43	2.21	East	0.7	0.88 (!)
W_44, W_44	2.2	West	0.7	0.88 (!)
W_45, W_45	0.79	West	0.7	0.88 (!)
W_46, W_46	1.94	East	0.7	0.88 (!)
W_47, W_47	1.94	East	0.7	0.88 (!)
D_4, D_4	2.12	East	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.043	
External wall	E12: Gable (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.09	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	
3 Air permeability (better than typically expected values are flagged with a subsequent (!))				
Maximum permitted air permeability at 50Pa		8 m³/hm²		
Dwelling air permeability at 50Pa		0.6 m³/hm², Design value (!)		OK
Air permeability test certificate reference				
4 Space heating				
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity				
Efficiency		342.7%		
Emitter type		Both radiators and underfloor		
Flow temperature		35°C		
System type		Heat Pump		
Manufacturer		Mitsubishi Electric Europe B.V.		
Model		Ecodan 6.0 kW		
Commissioning				
Secondary heating system: N/A				
Fuel		N/A		
Efficiency		N/A		
Commissioning				
5 Hot water				
Cylinder/store - type: Cylinder				
Capacity		210 litres		
Declared heat loss		2.06 kWh/day		
Primary pipework insulated		Yes		
Manufacturer				
Model				
Commissioning				
Waste water heat recovery system 1 - type: N/A				
Efficiency				
Manufacturer				
Model				

6 Controls		
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services		
Function		
Ecodesign class		
Manufacturer		
Model		
Water heating - type: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		
7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.53 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	95%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	4.26 kWp	
Orientation	East	
Pitch	30°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
Technology type: Photovoltaic system (2)		
Peak power	4.26 kWp	
Orientation	West	
Pitch	30°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:41

Project Information			
Assessed By	Liam Mason	Building Type	House, Mid-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	100 m ²
Site Reference	B_02	Plot Reference	B 02 3B6P
Address	B_02, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	9.8 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	-4.2 kgCO ₂ /m ²		OK

1b Target primary energy rate and dwelling primary energy			
Target primary energy	51.02 kWh _{PE} /m ²		
Dwelling primary energy	-9.26 kWh _{PE} /m ²		OK

1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	33.9 kWh/m ²		
Dwelling fabric energy efficiency	28.0 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.08	Roof (1) (0.08)	OK
Windows, doors, and roof windows	1.6	0.9	D_5 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))			
Name	Net area [m ²]	U-Value [W/m ² K]	
Exposed wall: Walls (1)	48.23	0.13	(!)
Party wall: Party Wall (1)	95.08	0	(!)
Ground floor: Floor 1, Floor 1	50.02	0.13	
Exposed roof: Roof (1)	50.02	0.08	(!)

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_48, W_48	0.79	West	0.7	0.88 (!)
W_49, W_49	1.94	East	0.7	0.88 (!)
W_50, W_50	2.2	West	0.7	0.88 (!)
W_51, W_51	1.94	East	0.7	0.88 (!)
W_52, W_52	0.41	East	0.7	0.88 (!)
W_53, W_53	2.21	East	0.7	0.88 (!)
W_54, W_54	0.74	East	0.7	0.88 (!)
W_55, W_55	1.74	West	0.7	0.88 (!)
W_56, W_56	0.79	West	0.7	0.88 (!)
W_57, W_57	1.94	West	0.7	0.88 (!)
D_5, D_5	2.12	East	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.043	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	
3 Air permeability (better than typically expected values are flagged with a subsequent (!))				
Maximum permitted air permeability at 50Pa		8 m³/hm²		
Dwelling air permeability at 50Pa		0.6 m³/hm², Design value (!)		OK
Air permeability test certificate reference				
4 Space heating				
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity				
Efficiency	335.5%			
Emitter type	Both radiators and underfloor			
Flow temperature	35°C			
System type	Heat Pump			
Manufacturer	Mitsubishi Electric Europe B.V.			
Model	Ecodan 6.0 kW			
Commissioning				
Secondary heating system: N/A				
Fuel	N/A			
Efficiency	N/A			
Commissioning				
5 Hot water				
Cylinder/store - type: Cylinder				
Capacity	210 litres			
Declared heat loss	2.06 kWh/day			
Primary pipework insulated	Yes			
Manufacturer				
Model				
Commissioning				
Waste water heat recovery system 1 - type: N/A				
Efficiency				
Manufacturer				
Model				
6 Controls				
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services				
Function				
Ecodesign class				
Manufacturer				
Model				
Water heating - type: Cylinder thermostat and HW separately timed				
Manufacturer				
Model				

7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.53 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	95%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	4.26 kWp	
Orientation	East	
Pitch	30°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
Technology type: Photovoltaic system (2)		
Peak power	4.26 kWp	
Orientation	West	
Pitch	45°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:		
	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:43

Project Information			
Assessed By	Liam Mason	Building Type	House, Mid-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	100 m ²
Site Reference	B_03	Plot Reference	B 03 3B6P
Address	B_03, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate

Fuel for main heating system	Electricity
Target carbon dioxide emission rate	9.8 kgCO ₂ /m ²
Dwelling carbon dioxide emission rate	-4.2 kgCO ₂ /m ² OK

1b Target primary energy rate and dwelling primary energy

Target primary energy	51.02 kWh _{PE} /m ²
Dwelling primary energy	-9.26 kWh _{PE} /m ² OK

1c Target fabric energy efficiency and dwelling fabric energy efficiency

Target fabric energy efficiency	33.9 kWh/m ²
Dwelling fabric energy efficiency	28.0 kWh/m ² OK

2a Fabric U-values

Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.08	Roof (1) (0.08)	OK
Windows, doors, and roof windows	1.6	0.9	D_5 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))

Name	Net area [m ²]	U-Value [W/m ² K]
Exposed wall: Walls (1)	48.23	0.13 (!)
Party wall: Party Wall (1)	95.08	0 (!)
Ground floor: Floor 1, Floor 1	50.02	0.13
Exposed roof: Roof (1)	50.02	0.08 (!)

2c Openings (better than typically expected values are flagged with a subsequent (!))

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_48, W_48	0.79	East	0.7	0.88 (!)
W_49, W_49	1.94	West	0.7	0.88 (!)
W_50, W_50	2.2	East	0.7	0.88 (!)
W_51, W_51	1.94	West	0.7	0.88 (!)
W_52, W_52	0.41	West	0.7	0.88 (!)
W_53, W_53	2.21	West	0.7	0.88 (!)
W_54, W_54	0.74	West	0.7	0.88 (!)
W_55, W_55	1.74	East	0.7	0.88 (!)
W_56, W_56	0.79	East	0.7	0.88 (!)
W_57, W_57	1.94	East	0.7	0.88 (!)
D_5, D_5	2.12	West	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.043	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	
3 Air permeability (better than typically expected values are flagged with a subsequent (!))				
Maximum permitted air permeability at 50Pa		8 m³/hm²		
Dwelling air permeability at 50Pa		0.6 m³/hm², Design value (!)		OK
Air permeability test certificate reference				
4 Space heating				
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity				
Efficiency		335.5%		
Emitter type		Both radiators and underfloor		
Flow temperature		35°C		
System type		Heat Pump		
Manufacturer		Mitsubishi Electric Europe B.V.		
Model		Ecodan 6.0 kW		
Commissioning				
Secondary heating system: N/A				
Fuel		N/A		
Efficiency		N/A		
Commissioning				
5 Hot water				
Cylinder/store - type: Cylinder				
Capacity		210 litres		
Declared heat loss		2.06 kWh/day		
Primary pipework insulated		Yes		
Manufacturer				
Model				
Commissioning				
Waste water heat recovery system 1 - type: N/A				
Efficiency				
Manufacturer				
Model				
6 Controls				
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services				
Function				
Ecodesign class				
Manufacturer				
Model				
Water heating - type: Cylinder thermostat and HW separately timed				
Manufacturer				
Model				

7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.53 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	95%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	4.26 kWp	
Orientation	East	
Pitch	30°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
Technology type: Photovoltaic system (2)		
Peak power	4.26 kWp	
Orientation	West	
Pitch	45°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:45

Project Information			
Assessed By	Liam Mason	Building Type	House, Mid-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	100 m ²
Site Reference	B_04	Plot Reference	B 04 3B6P
Address	B_04, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate

Fuel for main heating system	Electricity
Target carbon dioxide emission rate	9.95 kgCO ₂ /m ²
Dwelling carbon dioxide emission rate	-4.37 kgCO ₂ /m ² OK

1b Target primary energy rate and dwelling primary energy

Target primary energy	51.81 kWh _{PE} /m ²
Dwelling primary energy	-10.91 kWh _{PE} /m ² OK

1c Target fabric energy efficiency and dwelling fabric energy efficiency

Target fabric energy efficiency	34.5 kWh/m ²
Dwelling fabric energy efficiency	27.5 kWh/m ² OK

2a Fabric U-values

Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.08	Roof (1) (0.08)	OK
Windows, doors, and roof windows	1.6	0.9	D_6 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))

Name	Net area [m ²]	U-Value [W/m ² K]
Exposed wall: Walls (1)	48.23	0.13 (!)
Party wall: Party Wall (1)	95.08	0 (!)
Ground floor: Floor 1, Floor 1	50.02	0.13
Exposed roof: Roof (1)	50.02	0.08 (!)

2c Openings (better than typically expected values are flagged with a subsequent (!))

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_58, W_58	1.94	West	0.7	0.88 (!)
W_59, W_59	0.79	West	0.7	0.88 (!)
W_60, W_60	1.94	East	0.7	0.88 (!)
W_61, W_61	1.94	East	0.7	0.88 (!)
W_62, W_62	2.2	West	0.7	0.88 (!)
W_63, W_63	0.74	East	0.7	0.88 (!)
W_64, W_64	2.21	East	0.7	0.88 (!)
W_65, W_65	0.79	West	0.7	0.88 (!)
W_66, W_66	1.74	West	0.7	0.88 (!)
W_67, W_67	0.41	East	0.7	0.88 (!)
D_6, D_6	2.12	East	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.043	
External wall	E24: Eaves (insulation at ceiling level - inverted)	Calculated by person with suitable expertise	0.075	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
External wall	E25: Staggered party wall between dwellings	Calculated by person with suitable expertise	0.12	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	
3 Air permeability (better than typically expected values are flagged with a subsequent (!))				
Maximum permitted air permeability at 50Pa		8 m³/hm²		
Dwelling air permeability at 50Pa		0.6 m³/hm², Design value (!)		OK
Air permeability test certificate reference				
4 Space heating				
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity				
Efficiency		334.2%		
Emitter type		Both radiators and underfloor		
Flow temperature		35°C		
System type		Heat Pump		
Manufacturer		Mitsubishi Electric Europe B.V.		
Model		Ecodan 6.0 kW		
Commissioning				
Secondary heating system: N/A				
Fuel		N/A		
Efficiency		N/A		
Commissioning				
5 Hot water				
Cylinder/store - type: Cylinder				
Capacity		210 litres		
Declared heat loss		2.06 kWh/day		
Primary pipework insulated		Yes		
Manufacturer				
Model				
Commissioning				
Waste water heat recovery system 1 - type: N/A				
Efficiency				
Manufacturer				
Model				

6 Controls		
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services		
Function		
Ecodesign class		
Manufacturer		
Model		
Water heating - type: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		
7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.53 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	95%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	4.26 kWp	
Orientation	East	
Pitch	30°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
Technology type: Photovoltaic system (2)		
Peak power	4.26 kWp	
Orientation	West	
Pitch	45°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:48

Project Information			
Assessed By	Liam Mason	Building Type	House, End-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	142 m ²
Site Reference	B_05	Plot Reference	B 05 4B8P
Address	B_05, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	13.28 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	0.27 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	69.89 kWh _{PE} /m ²		
Dwelling primary energy	12.98 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	52.2 kWh/m ²		
Dwelling fabric energy efficiency	37.8 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.1	Roof (1) (0.1)	OK
Windows, doors, and roof windows	1.6	0.89	D_7 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))			
Name	Net area [m ²]	U-Value [W/m ² K]	
Exposed wall: Walls (1)	165.2	0.13	(!)
Party wall: Party Wall (1)	47.54	0	(!)
Ground floor: Floor 1, Floor 1	47.35	0.13	
Exposed roof: Roof (1)	47.35	0.1	(!)

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_68, W_68	0.74	North	0.7	0.88 (!)
W_69, W_69	1.94	East	0.7	0.88 (!)
W_70, W_70	0.41	North	0.7	0.88 (!)
W_71, W_71	1.74	West	0.7	0.88 (!)
W_72, W_72	2.2	West	0.7	0.88 (!)
W_73, W_73	2.21	North	0.7	0.88 (!)
W_74, W_74	1.94	West	0.7	0.88 (!)
W_75, W_75	1.94	East	0.7	0.88 (!)
W_76, W_76	1.94	West	0.7	0.88 (!)
W_77, W_77	2.21	East	0.7	0.88 (!)
W_78, W_78	1.94	West	0.7	0.88 (!)
W_79, W_79	2.21	North	0.7	0.88 (!)
W_80, W_80	2.21	North	0.7	0.88 (!)

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_81, W_81	2.21	North	0.7	0.88 (!)
W_82, W_82	0.79	North	0.7	0.88 (!)
W_83, W_83	2.21	North	0.7	0.88 (!)
W_84, W_84	2.21	North	0.7	0.88 (!)
W_85, W_85	0.79	North	0.7	0.88 (!)
D_7, D_7	2.12	North	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))

Building part **1 - Main Dwelling**: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E24: Eaves (insulation at ceiling level - inverted)	Calculated by person with suitable expertise	0.075	
External wall	E15: Flat roof with parapet	Calculated by person with suitable expertise	0.07	
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.09	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
External wall	E25: Staggered party wall between dwellings	Calculated by person with suitable expertise	0.12	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	

3 Air permeability (better than typically expected values are flagged with a subsequent (!))

Maximum permitted air permeability at 50Pa	8 m ³ /hm ²		
Dwelling air permeability at 50Pa	0.6 m ³ /hm ² , Design value (!)		
Air permeability test certificate reference	OK		

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity

Efficiency	352.3%
Emitter type	Both radiators and underfloor
Flow temperature	35°C
System type	Heat Pump
Manufacturer	Mitsubishi Electric Europe B.V.
Model	Ecodan 6.0 kW
Commissioning	

Secondary heating system: N/A

Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	210 litres
Declared heat loss	2.06 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	

Waste water heat recovery system 1 - type: N/A

Efficiency	
Manufacturer	
Model	

6 Controls		
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services		
Function		
Ecodesign class		
Manufacturer		
Model		
Water heating - type: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		
7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.57 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	94%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	4.26 kWp	
Orientation	Horizontal	
Pitch	Horizontal	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:50

Project Information			
Assessed By	Liam Mason	Building Type	House, End-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	142 m ²
Site Reference	C_01	Plot Reference	C 01 4B8P
Address	C_01, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	11.78 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	0.06 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	61.82 kWh _{PE} /m ²		
Dwelling primary energy	10.93 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	45.6 kWh/m ²		
Dwelling fabric energy efficiency	31.7 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.1	Roof (1) (0.1)	OK
Windows, doors, and roof windows	1.6	0.89	D_8 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))		
Name	Net area [m ²]	U-Value [W/m ² K]
Exposed wall: Walls (1)	165.2	0.13 (!)
Party wall: Party Wall (1)	47.54	0 (!)
Ground floor: Floor 1, Floor 1	47.35	0.13
Exposed roof: Roof (1)	47.35	0.1 (!)

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_86, W_86	2.21	South	0.7	0.88 (!)
W_87, W_87	0.74	South	0.7	0.88 (!)
W_88, W_88	1.94	East	0.7	0.88 (!)
W_89, W_89	0.41	South	0.7	0.88 (!)
W_90, W_90	2.21	South	0.7	0.88 (!)
W_91, W_91	2.2	East	0.7	0.88 (!)
W_92, W_92	1.94	East	0.7	0.88 (!)
W_93, W_93	1.94	East	0.7	0.88 (!)
W_94, W_94	0.79	South	0.7	0.88 (!)
W_95, W_95	2.21	West	0.7	0.88 (!)
W_96, W_96	1.74	East	0.7	0.88 (!)
W_97, W_97	2.21	South	0.7	0.88 (!)
W_98, W_98	1.94	West	0.7	0.88 (!)

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_99, W_99	2.21	South	0.7	0.88 (!)
W_100, W_100	2.21	South	0.7	0.88 (!)
W_101, W_101	2.21	South	0.7	0.88 (!)
W_102, W_102	0.79	South	0.7	0.88 (!)
W_103, W_103	1.94	West	0.7	0.88 (!)
D_8, D_8	2.12	South	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))

Building part **1 - Main Dwelling**: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E24: Eaves (insulation at ceiling level - inverted)	Calculated by person with suitable expertise	0.075	
External wall	E15: Flat roof with parapet	Calculated by person with suitable expertise	0.07	
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.09	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
External wall	E25: Staggered party wall between dwellings	Calculated by person with suitable expertise	0.12	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	

3 Air permeability (better than typically expected values are flagged with a subsequent (!))

Maximum permitted air permeability at 50Pa	8 m ³ /hm ²		
Dwelling air permeability at 50Pa	0.6 m ³ /hm ² , Design value (!)		
Air permeability test certificate reference	OK		

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity

Efficiency	352.3%
Emitter type	Both radiators and underfloor
Flow temperature	35°C
System type	Heat Pump
Manufacturer	Mitsubishi Electric Europe B.V.
Model	Ecodan 6.0 kW
Commissioning	

Secondary heating system: N/A

Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	210 litres
Declared heat loss	2.06 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	

Waste water heat recovery system 1 - type: N/A

Efficiency	
Manufacturer	
Model	

6 Controls		
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services		
Function		
Ecodesign class		
Manufacturer		
Model		
Water heating - type: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		
7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.57 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	94%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	4.26 kWp	
Orientation	South	
Pitch	Horizontal	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:52

Project Information			
Assessed By	Liam Mason	Building Type	House, Mid-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	100 m ²
Site Reference	C_02	Plot Reference	C 02 3B6P
Address	C_02, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	9.93 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	-3.99 kgCO ₂ /m ²		OK

1b Target primary energy rate and dwelling primary energy			
Target primary energy	51.69 kWh _{PE} /m ²		
Dwelling primary energy	-8.43 kWh _{PE} /m ²		OK

1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	34.4 kWh/m ²		
Dwelling fabric energy efficiency	27.4 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.08	Roof (1) (0.08)	OK
Windows, doors, and roof windows	1.6	0.9	D_9 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))			
Name	Net area [m ²]	U-Value [W/m ² K]	
Exposed wall: Walls (1)	48.23	0.13 (!)	
Party wall: Party Wall (1)	95.08	0 (!)	
Ground floor: Floor 1, Floor 1	50.02	0.13	
Exposed roof: Roof (1)	50.02	0.08 (!)	

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_104, W_104	0.74	West	0.7	0.88 (!)
W_105, W_105	0.79	East	0.7	0.88 (!)
W_106, W_106	2.21	West	0.7	0.88 (!)
W_107, W_107	0.41	West	0.7	0.88 (!)
W_108, W_108	1.94	East	0.7	0.88 (!)
W_109, W_109	2.2	East	0.7	0.88 (!)
W_110, W_110	1.94	West	0.7	0.88 (!)
W_111, W_111	1.94	West	0.7	0.88 (!)
W_112, W_112	1.74	East	0.7	0.88 (!)
W_113, W_113	0.79	East	0.7	0.88 (!)
D_9, D_9	2.12	West	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.043	
External wall	E24: Eaves (insulation at ceiling level - inverted)	Calculated by person with suitable expertise	0.075	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
External wall	E25: Staggered party wall between dwellings	Calculated by person with suitable expertise	0.12	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	
3 Air permeability (better than typically expected values are flagged with a subsequent (!))				
Maximum permitted air permeability at 50Pa		8 m³/hm²		
Dwelling air permeability at 50Pa		0.6 m³/hm², Design value (!)		OK
Air permeability test certificate reference				
4 Space heating				
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity				
Efficiency		334.2%		
Emitter type		Both radiators and underfloor		
Flow temperature		35°C		
System type		Heat Pump		
Manufacturer		Mitsubishi Electric Europe B.V.		
Model		Ecodan 6.0 kW		
Commissioning				
Secondary heating system: N/A				
Fuel		N/A		
Efficiency		N/A		
Commissioning				
5 Hot water				
Cylinder/store - type: Cylinder				
Capacity		210 litres		
Declared heat loss		2.06 kWh/day		
Primary pipework insulated		Yes		
Manufacturer				
Model				
Commissioning				
Waste water heat recovery system 1 - type: N/A				
Efficiency				
Manufacturer				
Model				

6 Controls		
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services		
Function		
Ecodesign class		
Manufacturer		
Model		
Water heating - type: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		
7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.53 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	95%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	4.26 kWp	
Orientation	East	
Pitch	45°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
Technology type: Photovoltaic system (2)		
Peak power	4.26 kWp	
Orientation	West	
Pitch	45°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:55

Project Information			
Assessed By	Liam Mason	Building Type	House, Mid-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	100 m ²
Site Reference	C_03	Plot Reference	C 03 3B6P
Address	C_03, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	9.93 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	-3.99 kgCO ₂ /m ²		OK

1b Target primary energy rate and dwelling primary energy			
Target primary energy	51.69 kWh _{PE} /m ²		
Dwelling primary energy	-8.43 kWh _{PE} /m ²		OK

1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	34.4 kWh/m ²		
Dwelling fabric energy efficiency	27.4 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.08	Roof (1) (0.08)	OK
Windows, doors, and roof windows	1.6	0.9	D_9 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))			
Name	Net area [m ²]	U-Value [W/m ² K]	
Exposed wall: Walls (1)	48.23	0.13 (!)	
Party wall: Party Wall (1)	95.08	0 (!)	
Ground floor: Floor 1, Floor 1	50.02	0.13	
Exposed roof: Roof (1)	50.02	0.08 (!)	

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_104, W_104	0.74	West	0.7	0.88 (!)
W_105, W_105	0.79	East	0.7	0.88 (!)
W_106, W_106	2.21	West	0.7	0.88 (!)
W_107, W_107	0.41	West	0.7	0.88 (!)
W_108, W_108	1.94	East	0.7	0.88 (!)
W_109, W_109	2.2	East	0.7	0.88 (!)
W_110, W_110	1.94	West	0.7	0.88 (!)
W_111, W_111	1.94	West	0.7	0.88 (!)
W_112, W_112	1.74	East	0.7	0.88 (!)
W_113, W_113	0.79	East	0.7	0.88 (!)
D_9, D_9	2.12	West	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))				
Building part 1 - Main Dwelling: Thermal bridging calculated from linear thermal transmittances for each junction				
Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E10: Eaves (insulation at ceiling level)	Calculated by person with suitable expertise	0.043	
External wall	E24: Eaves (insulation at ceiling level - inverted)	Calculated by person with suitable expertise	0.075	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
External wall	E25: Staggered party wall between dwellings	Calculated by person with suitable expertise	0.12	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	
Party wall	P2: Intermediate floor within a dwelling	SAP table default	0 (!)	
Party wall	P4: Roof (insulation at ceiling level)	Calculated by person with suitable expertise	0.24	
3 Air permeability (better than typically expected values are flagged with a subsequent (!))				
Maximum permitted air permeability at 50Pa		8 m³/hm²		
Dwelling air permeability at 50Pa		0.6 m³/hm², Design value (!)		OK
Air permeability test certificate reference				
4 Space heating				
Main heating system 1: Heat pump with radiators or underfloor heating - Electricity				
Efficiency		334.2%		
Emitter type		Both radiators and underfloor		
Flow temperature		35°C		
System type		Heat Pump		
Manufacturer		Mitsubishi Electric Europe B.V.		
Model		Ecodan 6.0 kW		
Commissioning				
Secondary heating system: N/A				
Fuel		N/A		
Efficiency		N/A		
Commissioning				
5 Hot water				
Cylinder/store - type: Cylinder				
Capacity		210 litres		
Declared heat loss		2.06 kWh/day		
Primary pipework insulated		Yes		
Manufacturer				
Model				
Commissioning				
Waste water heat recovery system 1 - type: N/A				
Efficiency				
Manufacturer				
Model				

6 Controls		
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services		
Function		
Ecodesign class		
Manufacturer		
Model		
Water heating - type: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		
7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.53 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	95%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	4.26 kWp	
Orientation	East	
Pitch	45°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
Technology type: Photovoltaic system (2)		
Peak power	4.26 kWp	
Orientation	West	
Pitch	45°	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

Building Regulations England Part L (BREL) Compliance Report

Approved Document L1 2021 Edition, England assessed by Array SAP 10 program, Array

Date: Wed 28 Aug 2024 10:16:57

Project Information			
Assessed By	Liam Mason	Building Type	House, End-terrace
OCDEA Registration	EES/027202	Assessment Date	2024-08-28

Dwelling Details			
Assessment Type	As designed	Total Floor Area	142 m ²
Site Reference	C_04	Plot Reference	C 04 4B8P
Address	C_04, RG30 2ZE		

Client Details	
Name	Eng Design
Company	Eng Design
Address	106-108 Bermondsey Street, London, SE1 3TX

This report covers items included within the SAP calculations. It is not a complete report of regulations compliance.

1a Target emission rate and dwelling emission rate			
Fuel for main heating system	Electricity		
Target carbon dioxide emission rate	13.29 kgCO ₂ /m ²		
Dwelling carbon dioxide emission rate	0.27 kgCO ₂ /m ²		OK
1b Target primary energy rate and dwelling primary energy			
Target primary energy	69.93 kWh _{PE} /m ²		
Dwelling primary energy	12.99 kWh _{PE} /m ²		OK
1c Target fabric energy efficiency and dwelling fabric energy efficiency			
Target fabric energy efficiency	52.2 kWh/m ²		
Dwelling fabric energy efficiency	37.9 kWh/m ²		OK

2a Fabric U-values				
Element	Maximum permitted average U-Value [W/m ² K]	Dwelling average U-Value [W/m ² K]	Element with highest individual U-Value	
External walls	0.26	0.13	Walls (1) (0.13)	OK
Party walls	0.2	0	Party Wall (1) (0)	N/A
Curtain walls	1.6	0	N/A	N/A
Floors	0.18	0.13	Floor 1 (0.13)	OK
Roofs	0.16	0.1	Roof (1) (0.1)	OK
Windows, doors, and roof windows	1.6	0.89	D_8 (1)	OK
Rooflights	2.2	N/A	N/A	N/A

2b Envelope elements (better than typically expected values are flagged with a subsequent (!))			
Name	Net area [m ²]	U-Value [W/m ² K]	
Exposed wall: Walls (1)	165.2	0.13 (!)	
Party wall: Party Wall (1)	47.54	0 (!)	
Ground floor: Floor 1, Floor 1	47.35	0.13	
Exposed roof: Roof (1)	47.35	0.1 (!)	

2c Openings (better than typically expected values are flagged with a subsequent (!))				
Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_86, W_86	2.21	North	0.7	0.88 (!)
W_87, W_87	0.74	North	0.7	0.88 (!)
W_88, W_88	1.94	East	0.7	0.88 (!)
W_89, W_89	0.41	North	0.7	0.88 (!)
W_90, W_90	2.21	North	0.7	0.88 (!)
W_91, W_91	2.2	East	0.7	0.88 (!)
W_92, W_92	1.94	East	0.7	0.88 (!)
W_93, W_93	1.94	East	0.7	0.88 (!)
W_94, W_94	0.79	North	0.7	0.88 (!)
W_95, W_95	2.21	West	0.7	0.88 (!)
W_96, W_96	1.74	East	0.7	0.88 (!)
W_97, W_97	2.21	North	0.7	0.88 (!)
W_98, W_98	1.94	West	0.7	0.88 (!)

Name	Area [m ²]	Orientation	Frame factor	U-Value [W/m ² K]
W_99, W_99	2.21	North	0.7	0.88 (!)
W_100, W_100	2.21	North	0.7	0.88 (!)
W_101, W_101	2.21	North	0.7	0.88 (!)
W_102, W_102	0.79	North	0.7	0.88 (!)
W_103, W_103	1.94	West	0.7	0.88 (!)
D_8, D_8	2.12	North	N/A	1 (!)

2d Thermal bridging (better than typically expected values are flagged with a subsequent (!))

Building part **1 - Main Dwelling**: Thermal bridging calculated from linear thermal transmittances for each junction

Main element	Junction detail	Source	Psi value [W/mK]	Drawing / reference
External wall	E2: Other lintels (including other steel lintels)	Calculated by person with suitable expertise	0.043	
External wall	E3: Sill	Calculated by person with suitable expertise	0.042	
External wall	E4: Jamb	Calculated by person with suitable expertise	0.068	
External wall	E5: Ground floor (normal)	Calculated by person with suitable expertise	0.103	
External wall	E6: Intermediate floor within a dwelling	Calculated by person with suitable expertise	0.07	
External wall	E24: Eaves (insulation at ceiling level - inverted)	Calculated by person with suitable expertise	0.075	
External wall	E15: Flat roof with parapet	Calculated by person with suitable expertise	0.07	
External wall	E16: Corner (normal)	Calculated by person with suitable expertise	0.09	
External wall	E18: Party wall between dwellings	Calculated by person with suitable expertise	0.06	
External wall	E25: Staggered party wall between dwellings	Calculated by person with suitable expertise	0.12	
Party wall	P1: Ground floor	Calculated by person with suitable expertise	0.13	

3 Air permeability (better than typically expected values are flagged with a subsequent (!))

Maximum permitted air permeability at 50Pa	8 m ³ /hm ²		
Dwelling air permeability at 50Pa	0.6 m ³ /hm ² , Design value (!)		
Air permeability test certificate reference	OK		

4 Space heating

Main heating system 1: Heat pump with radiators or underfloor heating - Electricity

Efficiency	352.3%
Emitter type	Both radiators and underfloor
Flow temperature	35°C
System type	Heat Pump
Manufacturer	Mitsubishi Electric Europe B.V.
Model	Ecodan 6.0 kW
Commissioning	

Secondary heating system: N/A

Fuel	N/A
Efficiency	N/A
Commissioning	

5 Hot water

Cylinder/store - type: Cylinder

Capacity	210 litres
Declared heat loss	2.06 kWh/day
Primary pipework insulated	Yes
Manufacturer	
Model	
Commissioning	

Waste water heat recovery system 1 - type: N/A

Efficiency	
Manufacturer	
Model	

6 Controls		
Main heating 1 - type: Time and temperature zone control by arrangement of plumbing and electrical services		
Function		
Ecodesign class		
Manufacturer		
Model		
Water heating - type: Cylinder thermostat and HW separately timed		
Manufacturer		
Model		
7 Lighting		
Minimum permitted light source efficacy	75 lm/W	
Lowest light source efficacy	80.5 lm/W	OK
External lights control	N/A	
8 Mechanical ventilation		
System type: Balanced whole-house mechanical ventilation with heat recovery		
Maximum permitted specific fan power	1.5 W/(l/s)	
Specific fan power	0.57 W/(l/s)	OK
Minimum permitted heat recovery efficiency	73%	
Heat recovery efficiency	94%	OK
Manufacturer/Model	ComfoAir Q350 GB ST	
Commissioning		
9 Local generation		
Technology type: Photovoltaic system (1)		
Peak power	4.26 kWp	
Orientation	Horizontal	
Pitch	Horizontal	
Overshading	None or very little	
Manufacturer		
MCS certificate		
10 Heat networks		
N/A		
11 Supporting documentary evidence		
N/A		
12 Declarations		
a. Assessor Declaration		
This declaration by the assessor is confirmation that the contents of this BREL Compliance Report are a true and accurate reflection based upon the design information submitted for this dwelling for the purpose of carrying out the "As designed" assessment, and that the supporting documentary evidence (SAP Conventions, Appendix 1 (documentary evidence) schedules the minimum documentary evidence required) has been reviewed in the course of preparing this BREL Compliance Report.		
Signed:	Assessor ID:	
Name:	Date:	
b. Client Declaration		
N/A		

APPENDIX B: DESIGN STAGE SBEM ASSESSMENT



Design Stage Part L2 SBEM Assessment:

'Amethyst Lane: Respite Centre'

Project Number	OP-C296
Site Address	Amethyst Lane, Reading, RG30 2EZ
Date	05/09/2024
Contact Name	Martin Skinner, Imran Hafiz
Company:	Eng Design
Email Address	MartinS@engdesign.co.uk , ImranH@engdesign.co.uk
Assessor	Liam Mason

Summary of Results

EPC Rating	Building Emission Rate (BER)	Target Emission Rate (TER)	Building Primary Energy Rate (BPER)	Target Primary Energy Rate (TPER)
	kgCO ₂ /m ² per year		kWh _{PE} /m ² per year	
A+(-6)	-5.62	6.17	-70.98	65.81

Assessor's Notes

Compliance Margins:

TER/BER: - **191.1%**

TPER/BPER: -**207.9%**

Results show that the proposed new building complies with the requirements of ADL Volume 2 emission and primary energy requirements.

Minimum Energy Efficiency Requirements (sections 4 and 5):

Parameters within design that exceed recommended design limits stipulated in Approved Part L Volume 2:
None with assumptions made

Limiting the effects of solar gains in the summer:

The cumulative solar gain for all applicable zones has been calculated.

One of zones fail to comply with Paragraphs 4.16-4.18 of 'Approved Document L Volume 2'.
Specification or architectural changes are required to reduce the level of transmitted solar gain:

Office Lobby A 0 44

Elements in **Red** below are assumed values and should be ascertained from the design team once available. Significant negative deviations from the below specification may lead to a failure in Part L compliance.

Version:

V1 First issue 05/09/24

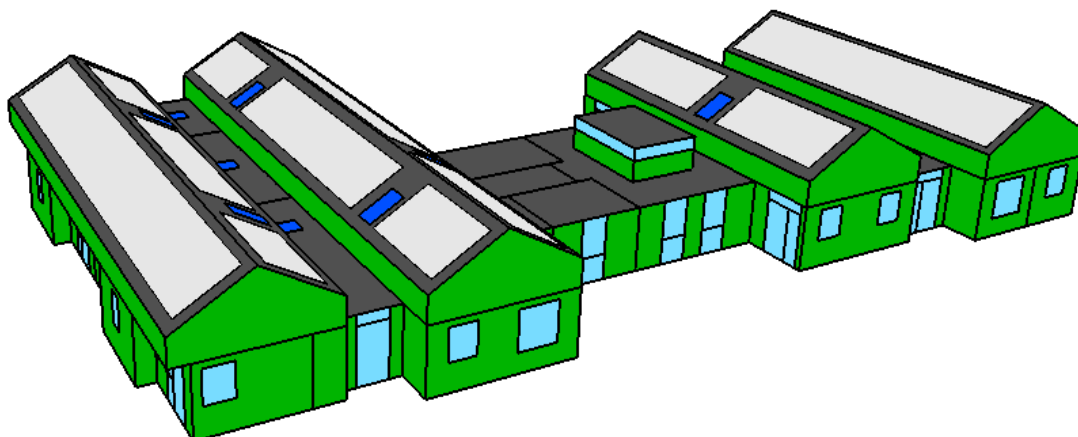


Thermal Model and Geometry

Software: Design Builder: Version 7.2.0.032.

Assessed under 2021 Part L Building Regulations.

Model Image:



Drawing Type	Reference
Ground Floor Plan	'Block D Ground Floor Proposed', Metashape Architects, Drawing Ref 24017-MET-ZD-00-DG-A-2400, Revision P01 (05/07/24)
Roof Plan	'Block D Roof Proposed', Metashape Architects, Drawing Ref 24017-MET-ZD-RF-DG-A-2405, Revision P01 (05/07/24)
Elevation 1	'Block D Elevation 1 Proposed', Metashape Architects, Drawing Ref 24017-MET-ZD-00-DG-A-4400, Revision P01 (05/07/24)
Elevation 2	'Block D Elevation 2 Proposed', Metashape Architects, Drawing Ref 24017-MET-ZD-00-DG-A-4401, Revision P01 (05/07/24)
Section 1	'Block D Sections Proposed', Metashape Architects, Drawing Ref 24017-MET-ZD-00-DG-A-3400, Revision P01 (05/07/24)



Construction Details

Element	Construction	U-Value
Floors	GF-01 Ground Floor: 150mm beam and block floor construction, 150mm PIR insulation, 65mm screed Construction and U-value calculation to be submitted to Assessor	0.13
External Walls	EW-01 External Walls: 102.5mm facing brickwork, 200mm Rockwool Nyrock 32 Cavity Batt insulation ($\lambda 0.032\text{W/mK}$), 100mm Medium dense blockwork. Construction and U-value calculation to be submitted to Assessor	0.13
Roofs	PR-01 Pitched Roofs Insulated Ceilings: Mineral wool insulation cross laid over joists, 150mm mineral wool insulation between joists, 12.5mm plasterboard, 15mm OSB, 100mm service void, 12.5mm plasterboard	0.08
	FR-01 Flat Roofs: Waterproofing layers, tapered rigid PIR insulation, 150mm concrete deck, 100mm service void, 12.5mm plasterboard. Construction and U-value calculations to be submitted to Assessor	0.10
Openings	Windows: Triple glazed, argon filled fittings, calculated frame factor for all fittings: 0.336. G-value: 0.45 Light Transmittance (LT) Value: 0.65 Doors: Manufacturers declaration (classed as windows due to glazing fraction).	0.88
	Rooflights: Triple glazed, argon filled fittings, calculated frame factor for all fittings: 0.336. G-value: 0.45 Light Transmittance (LT) Value: 0.65 Full detailed window/rooflight schedule to be provided with declarations of U-values G-values and LT values.	0.88
	Spandrel Panels/doors (to plant/bins): Metal, PIR Insulation, metal Confirmation from manufacturer required for U-value.	1.60
Partitions	PT-01 Typical Internal Partitions: blockwork, plasterboard on battens either side.	N / A
	PT-02 Exposed Rooflight Upstands (within cold pitched roofs): Timber frame construction, PIR insulation, timber frame/PIR insulation, 12.5mm plasterboard.	0.18
	PT-03 Exposed Partitions (between Plant/bin stores and heated areas): PIR insulation, blockwork. Detailed Partition schedule to be submitted to assessor with u-value calculations for exposed partitions.	0.18
Thermal Bridging	SBEM Default Psi Values have been used within the calculation to account for thermal bridging.	
Target Air Permeability	0.60m ³ /hm ² (50pPa) Building to be tested and certificate issued to assessor before EPC lodgement.	



HVAC System 1 (Ref: ASHP Underfloor Heating)		
Heating	System Type/ Source	Heat Pump (Electric) Air Source – Central Heat Generator(s) with water distribution and floor heating.
	Areas Served	All zones (excluding plant/bin stores)
	Seasonal Efficiency	SCOP: 3.57
	Heating Circulator Pump	Variable, differential sensor across pump
	Monitoring	Present, alarm for out-of-range values
	System Controls	Local Temperature Control (room by room)

Heating specification to be confirmed on above particulars

DHW System 1	
System Type/Source	Same as HVAC System 1
Areas Served	All Zones
Efficiency	N / A
Storage Volume / Losses	1000l capacity cylinder, 4.70 kWh/day standing heat loss (514.79 MJ/month)
Secondary Circulation	Estimated loop length: 89m (NCM conventions) Loss: 7.13 W/m (based on 22mm diameter pipework using Table 39 of Non-Domestic Building Services Compliance Guide 2013 Edition). Pump power (kW): 0.100 Time control on secondary circulation

Hot water storage and circulation specification to be confirmed on above particulars

Mechanical Ventilation 1 MVHR	
Type / model	Nuaire XBC 25HA-LL4-xPxS1S
Areas Served	Communal/Accommodation
SFP	1.30
Heat Recovery	85%, plate heat exchanger
Demand Controlled	None, Flow Regulation: Damper Control

Mechanical Ventilation 2 MVHR	
Type / model	Nuaire XBC 15HA-LL4-xPxS1S.
Areas Served	Offices
SFP	1.30
Heat Recovery	85%, plate heat exchanger
Demand Controlled	None, Flow Regulation: Damper Control

MVHR specifications to be confirmed on above particulars



Luminaire Specification (No calculations carried out)

Zone	Fittings	Efficacy (Lm/W)	Controls
All Zones		130	Manual Switching

Fittings	Make	Model	Wattage (W)	Lumen (Lm)	Efficacy (Lm/W)

Full lighting specification to be submitted to assessor.

Renewables

PV modules installed on Pitched sloping roofs.
210 panels (from submitted roof plan)
Total 74.55 kWp installed/connected to building (38.34kWp East facing, 36.21 kWp West)

Overshading: assumed 'None or very little (<20%)
Ventilation Strategy: Moderately ventilated modules

Full PV specification to be submitted to assessor with commissioning certificates.

Additional Specification Items:

A power correction device will not or has not been installed a default factor of <0.90 has been applied.
A BMS facility will be installed with the capacity for energy monitoring and targeting with alarms out of range values.



Design Stage Developer Statement: Amethyst Lane OP-C296

Disclaimer:

The Results in the attached schedule have been prepared based on working drawings, specification and other correspondence provided. Any deviation from any of this documentation or the above specifications, will invalidate the SBEM and PEA results.

I have read the above construction and specification notes and can confirm they are reasonable and following the agreed design team's strategy. Please proceed and produce design stage BRUKL and PEA for this unit.

Signed:.....Dated:.....

Print Name:.....Contact Number:.....